# Massachusetts Cultural Resource Information System

## Scanned Record Cover Page

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|---|---|
| **Inventory No:** | NAT.D |
| **Historic Name:** | Natick Research and Development Laboratories |
| **Common Name:** | U. S. Army Laboratory and Housing Complex |
| **Address:** | |
| **City/Town:** | Natick |
| **Village/Neighborhood:** | Natick |
| **Local No:** | |
| **Year Constructed:** | |
| **Architect(s):** | Ballinger Company; Fuller, George A. Company; Glaser, Samuel Associates; Magher, Arthur E. Company; U. S. Army Corps of Engineers |
| **Architectural Style(s):** | |
| **Use(s):** | Fort or Base; Laboratory - Research Facility; Military Other |
| **Significance:** | Architecture; Invention; Military; Science |
| **Area(s):** | |
| **Designation(s):** | |

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NAT.B

# FORM A - AREA

| Assessor's Sheets | USGS Quad | Area Letter | Form Numbers in Area |
|---|---|---|---|
| | NATICK | D | NAT.232-236, 257-260,#1-#5 |

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

**Town** Natick

*hborhood or village)* United States Army Soldier Systems Center (SSC) Natick

**Area** United States Army Soldier Systems Center (SSC) Natick

**se** U. S. Army Installation

**ion Dates or Period** 1953-1968

**ondition** Good

**rusions and Alterations** Additional construction to present

**Sketch Map**
***Draw a map of the area indicating properties within it. Circle and number properties for which individual inventory forms have been completed. Label streets including route numbers, if any. Attach a continuation sheet if space is not sufficient here. Indicate north.***

**See Continuation Sheet for Sketch Map.**

**Acreage** 78

**Recorded by** Stacey L. Griffin, Kelly Nolte, and Mark A. Steinback

**Organization** Panamerican Consultants, Inc. Buffalo, New York

**Date** *(month/year)* June 2001 (Update from 1997 form)

NAT. D

**AREA FORM**

**ARCHITECTURAL DESCRIPTION** ☒ *see continuation sheet*
*Describe architectural, structural and landscape features and evaluate in terms of other areas within the community*

SSC Natick, known locally as Natick Laboratories, is located in the Town of Natick, Middlesex County, Massachusetts, at the South Basin of Lake Cochituate. The installation is approximately 18 miles southwest of Boston and approximately one mile north of Natick's city center (Figure 1). The installation is comprised of four areas that include the main post laboratory complex (institutionally referred to as the Natick Area), with two associated housing developments (Heritage Lane and Kansas Street) and three off-site housing developments in the towns of Hudson, Sudbury, and Wayland. SSC Natick's real property inventory lists 174 buildings and structures. The Natick Area includes 103 buildings and structures situated within 78 acres of the main post (Figure 2), which is bounded on the south, east and west sides by Lake Cochituate and to the north by residential development (refer to Nolte et al. 2002 for a real property inventory). SSC Natick's built environment dates from 1953 to the present with the entire area fully developed, thus limiting future construction. Most of the installation's natural landscape features persist along the perimeter of the reservation boundary, which includes mature tree lines and beach areas. SSC Natick's original landscape "planting plan" was designed by Samuel Glaser Associates of Boston, Massachusetts. A 1956 blueprint is available at the Facilities Engineer Office/Real Property (SSC Natick nd).

**HISTORICAL NARRATIVE** ☒ *see continuation sheet*
*Explain historical development of the area. Discuss how this relates to the historical development of the community.*

The creation of what is now the U.S. Army Soldier Systems Center in Natick, Massachusetts, centralized and coordinated research and development efforts regarding the feeding, clothing, and equipping of the individual combat soldier. Prior to the U.S. entry into World War II, research and development activities conducted by the Quartermaster Corps (QMC) were limited to overcoming known clothing and equipment deficiencies, and were centered in the procurement division. During the early years of the war, the extreme and varied environments in which the war was being fought (e.g., the South Pacific, the Aleutians, North Africa) exacerbated existing problems with the materiel and rations then in use. Military planners recognized the need for environmentally appropriate materiel that could be shipped and utilized anywhere in the world. In September 1942, a Research and Development Branch was established within the Office of The Quartermaster General (OQMG) under the direction of Colonel (later Brigadier General) Georges F. Doriot, who served as head of the Military Planning Division (USACE, NED 1997:III-32; NRDEC 1994:2; Natick Laboratories 1968:116).

**BIBLIOGRAPHY and/or REFERENCES** ☒ *see continuation sheet*


Aldridge, George W., Jr. (Captain)
1959 QM Research & Engineering. *The Quartermaster Review* (September-October): 24-28, 146, 149.

Aneptek Corporation
1991 *Endangered Species Survey; Phase I An Environmental Inventory of Wildlife Species and Their Habitats.* Aneptek Corporation, Natick, MA. Prepared for U.S. Army Natick Research Development and Engineering Center, Natick, MA.


☒ Recommended for listing in the National Register of Historic Places. *If checked, you must attach a completed National Register Criteria Statement form*

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**INVENTORY FORM CONTINUATION SHEET**

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**ARCHITECTURAL DESCRIPTION (CONTINUED)**

Ground was broken 19 April 1952 for the Quartermaster Research and Development Center (QRDC) with construction beginning that November. The Philadelphia-based Ballinger Company was the architectural-engineering firm, the George A. Fuller Company of Boston served as the general contractor, and the Arthur E. Magher Company, Inc., New York, erected the test chambers of the Climatic Building (Building 2). The U.S. Army Corps of Engineers (USACE), New England District served as construction supervisor (NRDEC 1994: ii, 5-7; Buchanan and Johnson 1984:13; Fitch 1991:6; Quartermaster Research and Development Center 1954).

The Ballinger Company considers itself the oldest architectural firm in the United States, having celebrated its 120th anniversary in 1999 (Bottemly 2000). The current president of Ballinger, Bill Gustafson, believes that the company established its early reputation on its technical qualifications and ability to meet the needs of a manufacturing-based economy (Ballinger 2000). It was the first U.S. firm to integrate the disciplines of architecture and engineering, securing patents in the early 1920s for Super-Span sawtooth roof trusses, which helped flood industrial plants with natural light. Ballinger also pioneered designs in reinforced concrete [like SSC Natick] and other new materials (Ballinger 2000).

By the early 1900s Ballinger was one of the largest commercial and industrial firms in the United States. It designed landmark projects for the Victor Talking Machine Corporation (RCA) as well as the first facility for the Joseph M. Campbell Company (Campbell Soup Company). By the mid-1930s, Ballinger had completed 16 new hospitals. More technical innovations followed with the creation of the vertically expandable Robert Morris Hotel and Office Building and the TWA hanger at the Philadelphia Airport, which featured a cable-suspended, 150-foot cantilevered roof. The firm also created one of the earliest computer rooms for the ENIAC company during the 1950s, which led to the creation of related facilities at IBM and the Rand Corporation (Ballinger 2000). One of its later accomplishments for the Army was the "Hexagon" lab complex located at Fort Monmouth, New Jersey.

The Ballinger Company, still located in Philadelphia, Pennsylvania, continues to design state-of-the-art research facilities, medical facilities, and industrial structures. The company's new capabilities include strategic facility planning and assessment, site relocation, energy services, and sustainable design (Ballinger 2000).

To construct the initial complex at the Quartermaster Research and Development Center (QRDC), the Ballinger Company teamed with the George A. Fuller Company, General Contractor. The Fuller Company was founded in the 1880s by George A. Fuller (1851-1900), the man credited with the creation of the skyscraper (Today in Science History 2002). Fuller, a graduate of Andover College, entered his uncle's firm, Peabody & Sterns, as a draftsman but quickly climbed up the ranks of the company, making full partner by the time he was 25 (Society of Architectural Historians 2002; Neo-tech 2002). He soon became interested in the problems of load bearing capabilities, including how much weight each part of a building could carry. Although architect Leroy S. Buffington patented the system for building skyscrapers using a metal skeleton frame, it was actually Fuller

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**ARCHITECTURAL DESCRIPTION (CONTINUED)**

who solved the load-bearing problems of tall buildings by developing the concept of a central support structure (Today in Science History 2002).

In the 1880s, Fuller left Peabody & Sterns and opened his own business in Chicago as a building contractor. In 1889, he designed and constructed the Tacoma Building in Chicago. This building was the first to employ the idea of curtain wall construction, an architectural concept in which a structure's exterior walls carry no weight, but rather serve only to provide a cosmetic façade and protection from the elements (Neo-tech 2002). In 1901, Fuller and architect Daniel Burnham collaborated on a 21-story office building erected on a small triangular plot of land at the corner of Broadway and 23rd Street in Manhattan. Built in the face of great public skepticism, the Flatiron Building (initially known as the Fuller Building) was one of New York's first skyscrapers (Neo-tech 2002). Its successful completion in 1902 paved the way for future New York skyscrapers (Cosmopolis 2002). Today about half of all large apartment and office buildings in this country are built using Fuller's steel cage system (Neo-tech 2002).

After Fuller's death in 1900, the company continued its founder's tradition, constructing edifices using cutting-edge techniques, technologies, and materials, and expanding with offices in Chicago, New York, Miami, Washington D.C and Philadelphia (Gindy 2002). During the depression, the company turned to public projects that included the construction of the Supreme Court Building, the Department of Justice Building, the National Archives Buildings, and the Department of the Interior Building, all in Washington D.C. The company also expanded into Canada and Cuba, building roads, bridges, and dams (Gindy 2002). Between 1930 and World War II, the George A Fuller Company constructed an impressive array of structures including the Pierre Hotel (1930), New York; the Philadelphia Museum of Art (1930); the Vanderbilt residence (1931), New York; the Louisiana State Capitol Building (1931), Baton Rouge; New York Central Railroad Viaduct (1933), New York; the Berwind Mausoleum (1932), Philadelphia; St. Luke's Hospital (1931), New York; Parklawn Housing Project (1937), Milwaukee; and the Kraft Cheese Factory (1937), Chicago.

During World War II, the Navy engaged the Fuller Company to complete a number of installations and awarded the firm contracts totaling over $25,000,000 (Gindy 2002). Probably the most significant contract was for a prefabricated, portable structure that could be shipped in pieces, and quickly and easily set up by untrained personnel. The prefabricated building the Fuller Company designed, the now ubiquitous Quonset Hut, was based on the British Nissan Hut design of World War I. It was named for Quonset Point, the installation where it was conceived and produced. Not only did the Fuller Company design the hut; it also built the factory (in only two months) and produced 170,000 huts by the end of the war (Gelbert 2001). The firm quickly gained a reputation within the military community for designing first rate products and facilities on tight budgets with unbelievably small turn around times.

By 1951, the George A. Fuller Company had accumulated a gross income in excess of $2 billion (Gindy 2002). In 1962, Fuller and the Del E. Webb Corporation were in charge of the first Minuteman Missile base at Malmstrom AFB, Montana (Gindy 2002). Fuller also teamed with NASA in a number of Space Shuttle related projects in the mid-1970s, including the construction of the Shuttle Mate-Demate Device (MDD) a large,

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**ARCHITECTURAL DESCRIPTION (CONTINUED)**

gantry-like, steel structure used to hoist orbiters off the ground during servicing operations (NASA 2002). Although Fuller completed a number of military jobs during this time, it still continued the company tradition of constructing high-profile engineering projects such as the Seagram Building (1958), NY; the United Steel Workers Building (1963), Pittsburgh; and 10 North Wacker (1970), Chicago.

The George A. Fuller Company continues to complete many engineering marvels within the U.S and around the world. The firm is now a U.S. subsidiary of Archirodon, an international marine contractor with a strong position in the Middle East and the Mediterranean region. The Archirodon group is a stakeholder in the Royal Boskalis Westminster nv ("Boskalis"), a shipping conglomerate in northern Europe (Hebels 2001).

By the QRDC's October 1954 dedication, the Ballinger and Fuller Companies had overseen the completion of ten buildings on the 78-acre site. Fuller was responsible for four of the five primary laboratory buildings including the Administration Building/Headquarters (Building 1), Research Building (Building 3), Development Building (Building 4), and Engineering Building (Building 5). Building 2, containing the arctic and tropic climatic chambers, was constructed in 1955 by Arthur E. Magher, Contractor. Other buildings erected during the initial construction period (1952-1956) were the Guard House (Building 6), the Laboratory Testing Building (Building 7), the Hazardous Research Building (Building 8), an enlisted men's barracks (Building 15), the elevated water tank (Building 18) and the Boiler-Pump House (Building 19). Necessary infrastructure included the construction of Building 9, a substation; Building 10, storage; Building 11, a fuel storage tank, (demolished before 2001); Building 12, a switching station; Building 13, an incinerator (demolished 2001); Building 14, a garage; Building 16, the General Contractor's Engineer's Field Office (not built as a permanent structure, demolished in 1962); Building 17, a substation; Building 20, a warehouse; four transistor sheds, Buildings T0024 –T0027; and Building 72, a fuel storage tank. These 25 buildings, plus Building 71, the central flagpole and a baseball field represent the installation's first wave of development (Table 1).

The main post at SSC Natick can be divided into three separate use areas - north, central, and south (Figure 2). The northern area of the installation (north of A Street) was created in a borrow pit and holds the post's mundane, service-related buildings such as warehouses and storage areas (Figure 3). Because the area is recessed, these service buildings are effectively screened from the immediate administration area. Initially this area contained only a baseball field and temporary shelters, but continued development has added research test sites and structures to the area as late as the 1990s. The central area of the installation (between A and D Streets) contains the core complex of laboratory buildings and post headquarters. The post's southernmost section (south of D Street) contains the outdoor recreation area including the recreation building (Building 32 - formerly the officers club), swimming pool, beach areas, and access to Lake Cochituate's surrounding natural areas. A helicopter landing area also is located in the southernmost tip of the installation.

The installation is arranged in a grid pattern that includes 12 named roadways. First through Sixth Avenues run north and south, while A through D Streets and Upper and Lower Entrance Lanes run west and east. The initial

construction plans depict two entrance/exit gates (Figure 4). Natick's original main gate with Guard House (Building S006) was located at the intersection of Kansas Street, Third Street, and A Street (Figure 5). A second

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**ARCHITECTURAL DESCRIPTION (CONTINUED)**

entrance depicted on the 1952 plans was located at Fourth Avenue and Kansas Street, east of the original main gate. The current entrance is located further east on Kansas Street and is centered between Upper Entrance Lane and Lower Entrance Lane. A 1973 construction date for the gate's sentry station may provide a clue to when the entrance was relocated. The installation's most prominent roadway is the central allée of Fourth Avenue, around which most of the post's significant buildings are clustered. Running between the main research laboratory buildings (Buildings 3, 4, and 5) and Headquarters (Building 1), the apex of the allée ends in a traffic roundabout and features SSC Natick's most significant structure, the Doriot Climatic Chambers (Building 2) (Figure 6).

SSC Natick's complex of International Style architecture was conceptualized by the renowned Ballinger Company of Philadelphia, which had previously completed a number of successful Quartermaster architectural projects, and was constructed by George A. Fuller of Boston (Figures 7-10). The laboratory complex's sleek style, composed in reinforced concrete, was used throughout the main post and continues to serve as a unifying visual element. The heights, widths, and lengths of all the structures mix comfortably and provide a sense of conformity through materials, design, association, and setting. The original core complex characterizes the International style with its flat roofs, smooth, unornamented concrete panel walls, and fenestrations of industrial-type windows. Physically confined by its location on a peninsula, which protects it from additional construction, the main post visually and physically demonstrates a cohesive built environment with a high-level of integrity, retaining near original appearance, as planned in the 1950s. What later construction did occur includes buildings of the same massing and complementary materials that achieve a cohesive contemporary feel and association with the original complex of buildings.

SSC Natick has lost only two permanent buildings from the original laboratory complex - Building 13 (an incinerator) and Building 11 (a fuel storage area). It currently plans demolition of one other structure in 2002, the 1954 water tower (Building 18). Surprisingly, few changes within the past fifty years have marred the landscape of the installation. Alterations include new construction throughout the 78-acre site and window replacements in Buildings 1, 3, 4, 5, 7, 15, and 36 in the 1970s and 1980s because of the energy crisis and security reasons, and some additions. These changes do not disturb the original design, association, or timelessness of the post as initially laid out for the Quartermaster Research and Development Center in 1952.

As listed in SSC Natick's comprehensive real property inventory, only the main post contains commemorative properties. These include Building 71, the central flagpole; Building 28, a memorial basketball court dedicated in the 1980s in the northern use area; and the Soldier statue located on a grassy knoll between Upper Entrance Lane and Headquarters (Building 1). Dedicated in 1995, the statue is a life-size combat-dressed soldier, with a plaque reading "Soldiers – Our – Credentials."

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**HISTORICAL NARRATIVE (CONTINUED)**

Despite an increasing emphasis on research and development, as well as efforts to organize its materiel supply lines more efficiently, the Army had to utilize existing QMC installations, which were dispersed throughout the United States. These installations included the Office of Quartermaster General (OQMC) in Washington, D.C.; textile and manufacturing shops at the Jeffersonville Quartermaster Depot in Indiana, the Chemicals, Plastics, and Textile laboratories as well as the Pioneering Research Laboratory at the Philadelphia Quartermaster Depot in Pennsylvania; the Climatic Research Laboratory in Lawrence, Massachusetts; and the Subsistence Research Laboratory (later the Quartermaster Food and Container Institute for the Armed Forces) in Chicago, Illinois. (Odell 1954; Natick Laboratories 1968:116-117).

During the early Cold War period, efforts to impose order and efficiency on the military's materiel development system led to the appropriation of $11 million by the U.S. Congress on 28 October 1949 for the construction of a QMC research laboratory. After a lengthy site selection process involving applications from more than 300 sites in 40 states, Natick, Massachusetts, was selected on 8 March 1951. Approximately 18 miles west of Boston and 30 miles east of Worcester, the 78-acre Natick site was chosen for its proximity to leading academic institutions, its climatic variety, and the availability of fresh water (i.e., Lake Cochituate) and transportation facilities. When site-clearing for construction began in 1952, the location at the south pond of Lake Cochituate was predominantly undeveloped woodland (NARADCOM 1978:182; Aneptek Corporation 1991:8). Ground was broken 19 April 1952 for the laboratory complex with construction beginning that November.

**1950s Development**

On 1 October 1953, the Quartermaster Research Laboratory was officially designated the Quartermaster Research and Development Center (QRDC), a QM Class II installation. The primary mission of the QRDC (the present–day Soldier Systems Center) was researching, developing and testing food, clothing, and personal and organizational equipment essential to the support of the individual combat soldier (The Quartermaster Review 1954a:66; Smalle 1954:11; Odell 1954; USACE, NED 1997:III-33-34; Buchanan and Johnson 1984:11; Fitch 1991:3). Also in October 1953, the Quartermaster Research and Development Command was established and headquartered at the QRDC in Natick. The facility was dedicated 14 October 1954 (The Quartermaster Review 1954b:24); NRDEC 1994:ii, 5-7). In 1954, the Quartermaster Research and Development Command had more than "100 active research and development projects aimed at the improvement of items for soldier use. Most of these projects [were] conducted with the participation and/or coordination of 22 other government agencies, principally the Army Field Service, the Air Force, all the Technical Services, the Office of the Surgeon General, the Navy, Ordnance, Signal and Chemical Corps, and the Atomic Energy Commission" (Odell 1954). The first commanding officer of the Natick installation was Brigadier General Charles G. Calloway.

By 1956, 27 facilities had been erected during the first wave of construction. These facilities comprised the installation's core laboratory complex

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**HISTORICAL NARRATIVE (CONTINUED)**

| | | | |
|---|---|---|---|
| Building 1 | Administration Building | Building 15 | Barracks Building |
| Building 2 | Climatic Research Lab | Building 16 | Engineer Field House |
| Building 3 | Research Building | Building 17 | Substation A |
| Building 4 | Development Building | Building 18 | Water Tank |
| Building 5 | Engineering Building | Building 19 | Boiler & Pump House |
| Building 6 | Guard House | Building 20 | Warehouse |
| Building 7 | U. S. Navy Lab Test Building | Building 71 | Flag Pole |
| Building 8 | Hazardous Research Building | Building 72 | Fuel Storage Tank |
| Building 9 | Substation | Building T0024 | Transistor Shelter Shed |
| Building 10 | Pump Station | Building T0025 | Transistor Shelter Shed |
| Building 11 | Fuel Storage Tank | Building T0026 | Transistor Shelter Shed |
| Building 12 | Switch Area | Building T0027 | Transistor Shelter Shed |
| Building 13 | Incinerator | Baseball Field | |
| Building 14 | Garage | | |

As initially established, research and development programs and types of laboratory space were building specific:

The Doriot Climatic Chambers (Building 2) provides both arctic and tropic chambers, in which "soldiers test themselves and their equipment against worldwide climatic extremes" (NRDEC 1994: 9) (Figure 11);

The Research Building (Building 3) contains offices and laboratories of the Earth Sciences Division, Pioneering Research Division, Air Delivery Equipment Division, and related services. A weather station is on the roof (Figure 12);

The Development Building (Building 4) houses offices and laboratories of the Clothing and Organic Materials Division, Mechanical Engineering Division, and branches of the Technical Services Division (Figure 13);

The Engineering Building (Building 5) contains a 40-ft rain tower, and machine shops, woodworking shops and special testing facilities of the Mechanical Engineering Division (Figure 14);

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The Hazardous Research Building (Building 8) is used by various operating divisions and (Figure 15);

"The Special Test Building (Building 7) is used for testing a variety of mechanical equipment including large items such as laundry, refrigeration, and petroleum, oils, and lubricants (POL) equipment" (The Review J-F 1962:11) (Figure 16).

In the mid-1950s, activities at the installation were divided into six primary divisions. Although each division had a different focus, the overall emphasis remained on the individual soldier. These divisions were: the Chemical and Plastic Division; the Environmental Protection Division; the Mechanical Engineering Division; the Textile, Clothing and Footwear Division; the Dispensing and Handling Equipment Division; and the Pioneering Research Division (Anonymous 1954). Each division utilized a variety of laboratories, offices, and storage space in several buildings throughout the installation.

The Chemical and Plastic Division was responsible for developing requirements for materiel affecting the health and efficiency of the soldier. The Division also developed items that would offer "the best possible protection against the elements, against weapons' hazards, destructive microorganisms, food or material destroying pests and vermin and protection against chemical, biological, or atomic warfare attacks" (USACE, NED 1997:III-35). The division comprised the Biological and Chemical Branch; the Body Armor Branch; the Films, Filaments and Coated Fabric Branch; the Plastics and Paper Branch; and the Rubber Branch (Anonymous 1954:Appendix C).

The Environmental Protection Division was charged with developing requirements for items (e.g., equipment, clothing, food) that protected the soldier from the environment and allowed him "to function with maximal efficiency under any environmental conditions, anywhere in the world" (USACE, NED 1997:III-35). The division contained a Stress Physiology Branch (involved with clothing), a Human Resources Branch (concerned with the soldier's psychological and psychophysiological reaction to the environment), a Biophysics Branch (utilizing test-chamber and field research), and an Environmental Research Branch (focused on geography, climatology, and cartography) (Anonymous 1954:Appendix C).

The Mechanical Engineering Division researched and developed new and improved equipment, such as laundry and refrigeration equipment, housing and tentage, heating equipment, cooking and baking equipment, and wood and metals products. The development of portable shelters and tentage with liners allowed for use in a wider variety of climates, especially colder areas. Tentage requirements specified ease of assembly with a minimum number of tools. In addition, tentage technologists focused on creating shelters that were lighter but more durable and that provided increased protection from heat and cold as well as being fire, water and microbiologically resistant (Anonymous 1954:Appendix C; Weikert 1956:24-25; USACE, NED 1997:III-35).

The Textile, Clothing and Footwear Division focused on developing fabrics, leather, clothing, dyes, etc., that facilitated the protection of the "combat soldier through his equipment. These items must provide a coordinated system of protection: against the environment; from enemy munitions; from observation" (USACE, NED 1997: III-35; Anonymous 1954:Appendix C).